Lectures on Research Design

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Overview of lectures

- Why do randomized controlled trials?
  - Dr. Epstein
- Testing treatment efficacy
  - Dr. Keefe
- Testing treatment effectiveness and interpretation of clinical research
  - Dr. Kaplan
- Issues in studying behavioral and pharmacological interventions
  - Dr. Epstein
- Behavioral placebos
  - Dr. Keefe

Goals of randomized controlled trials

- As discussed, randomized trials can be used to test
  - Test treatment efficacy
  - Test treatment effectiveness
- In addition, as experiments, randomized trials can be used to:

- Test whether variables studied in cross-sectional or prospective epidemiological designs can be considered causal variables
  - There are many variables that have been strongly related to health outcomes in correlational designs that when tested in experiments are not causally related to outcomes

- Test theory
  - Validate basic science
    - Translational research
  - Provide critical experimental test of a theory
- Hypothesis testing is critical to scientific progress
  - Hypothesis testing can confirm or disconfirm an hypothesis, but
  - New advances come from new paradigms
  - Creativity in science ranges from replications to "normal science" to creative shifts in paradigms
    - Sternbach's ideas about creativity
    - Garcia and taste aversion
  - Paradigm shifts come from following unusual results
    - Pavlov
    - Ader